

## CLAIMS

1. A balloon catheter cover comprising a tubular elastic fabric structure of interconnected circumferential and longitudinal yarns, the structure having a high degree of stretch and recovery in the circumferential direction.
2. The balloon catheter cover of claim 1 wherein there is essentially no change in length in the longitudinal direction over the full range of stretch and recovery in the circumferential direction.
3. The balloon catheter cover of claim 2 wherein the circumferential yarns have an elongation at break of more than 300%.
4. The balloon catheter cover of claim 3 wherein the longitudinal yarns have an elongation at break of less than 30%.
5. The balloon catheter cover of claim 1 wherein the degree of stretch in the circumferential direction is more than two times.
6. The balloon catheter cover of claim 1 wherein the degree of stretch is more than 3 times.
7. The balloon catheter cover of claim 1 wherein the longitudinal yarns are positioned at about zero degrees to the balloon axis and the circumferential yarns are positioned at an angle  $\emptyset$  to the axis of at least 70°.
8. The balloon catheter cover of claim 7 wherein the angle  $\emptyset$  is greater than 85°.
9. The balloon catheter cover of claim 8 wherein the angle  $\emptyset$  about 90°.
10. The balloon catheter cover of claim 1 wherein the fabric structure is a triaxial braid wherein the circumferential yarns are elastomeric braiding yarns and the longitudinal yarns are relatively stiff axial yarns.
11. The balloon catheter cover of claim 1 wherein the fabric structure is a woven fabric wherein the circumferential yarns are filling yarns and the longitudinal yarns are warp yarns.
12. The balloon catheter cover of claim 1 wherein the tubular structure is made from a fabric selected from the group of fabrics consisting of non-woven fabrics and those made by weft knitting and by warp knitting.
13. The balloon catheter cover of claim 12 wherein the tubular structure is made by sewing edges of a flat fabric together so as to make a tube having a longitudinal dimension and a circumferential dimension, the edges being sewn together being along the longitudinal dimension.
14. The balloon catheter cover of claim 1 wherein the elastomeric yarns are selected from the group consisting of yarns made from spandex fibers, fibers of polyurethane polymers, fibers of silicone elastomers, fibers of

polyester/polyether block copolymers, fibers of polypropylene, fibers of fluoroelastomers, fibers of elastomeric polyolefins, and fibers of combinations thereof.

- 5 15. The balloon catheter cover of claim 14 wherein the elastomeric yarns are spandex fibers wherein the segmented polyurethanes of the spandex fibers is selected from the group consisting of polyetherurethaneurea and polyesterurethaneurea block copolymers, or combinations thereof.
16. The balloon catheter cover of claim 15 wherein the spandex fibers are covered with a hard yarn.
- 10 17. The balloon catheter cover of claims 1 wherein the longitudinal yarns are selected from yarns made from fibers of polyesters; polyamides; aramids; polyolefins; polyglycolic acids; polylactic acids; fluoropolymers; and combinations thereof.
- 15 18. A process for making a tubular structure having a longitudinal dimension and a circumferential dimension to be used as a balloon catheter cover in which multiple longitudinal yarns are placed from a fixed source along the longitudinal dimension over a core so as to not intertwine with themselves and multiple circumferential yarns from moving sources are intertwined in the circumferential dimension with the longitudinal yarns and themselves.
- 20 19. The process of claim 18 in which the core is a balloon catheter.
20. The process of claim 18 in which the core is a removable mandrel.
21. The process of claim 20 in which the removable mandrel is an array on monofilament yarns.
22. The process of claims 18 where the circumferential yarns are intertwined with the longitudinal yarns and themselves by flat or circular weaving.
- 25 23. The process of claims 18 where the circumferential yarns are intertwined with the longitudinal yarns and themselves by triaxial braiding.
24. The process of claims 18 where the circumferential yarns are intertwined with the longitudinal yarns and themselves by knitting.
- 30 25. A braiding process for making balloon catheter covers comprising triaxially braiding 2, 4 or 6 elastomeric braiding yarns with multiple axial yarns.
26. A triaxial braiding process wherein the number of braiding yarn is less than half of the number of axial yarns.
- 35 27. The triaxial braiding process of claim 26 wherein the number of braiding yarns is less than or equal to one-eighth of the number of axial yarns.
28. The braiding process of claims 25 wherein the braid angle between the braiding yarn and the axial yarn is greater than 70°.

29. A method of making a balloon catheter cover in which the balloon catheter cover is formed directly over a balloon catheter.
30. A method of making a balloon catheter cover in which the balloon catheter cover is formed over a removable mandrel and the cover is subsequently placed over a catheter balloon.
- 5 31. The method of claim 30 in which the removable mandrel is a helical spring which is removed by unwinding the coils of the spring from the inside to cause the catheter cover to contract onto a balloon catheter.
32. The balloon catheter cover of claim 1 in which the properties vary along the length of the sleeve
- 10 33. A balloon catheter cover of claim 32 in which the properties vary by changes of the yarn spacing
34. A balloon catheter cover of claim 1 in which the shape is not cylindrical.
35. A method of making a balloon catheter cover of claim 33 in which the non-cylindrical shape is obtained by the using of a shaped mandrel.
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